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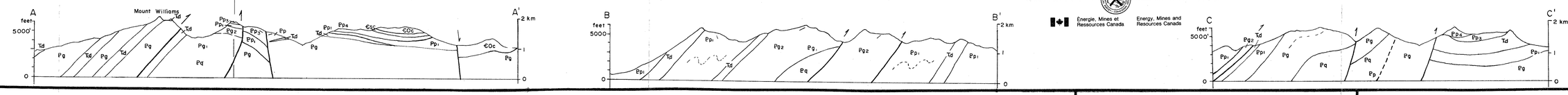

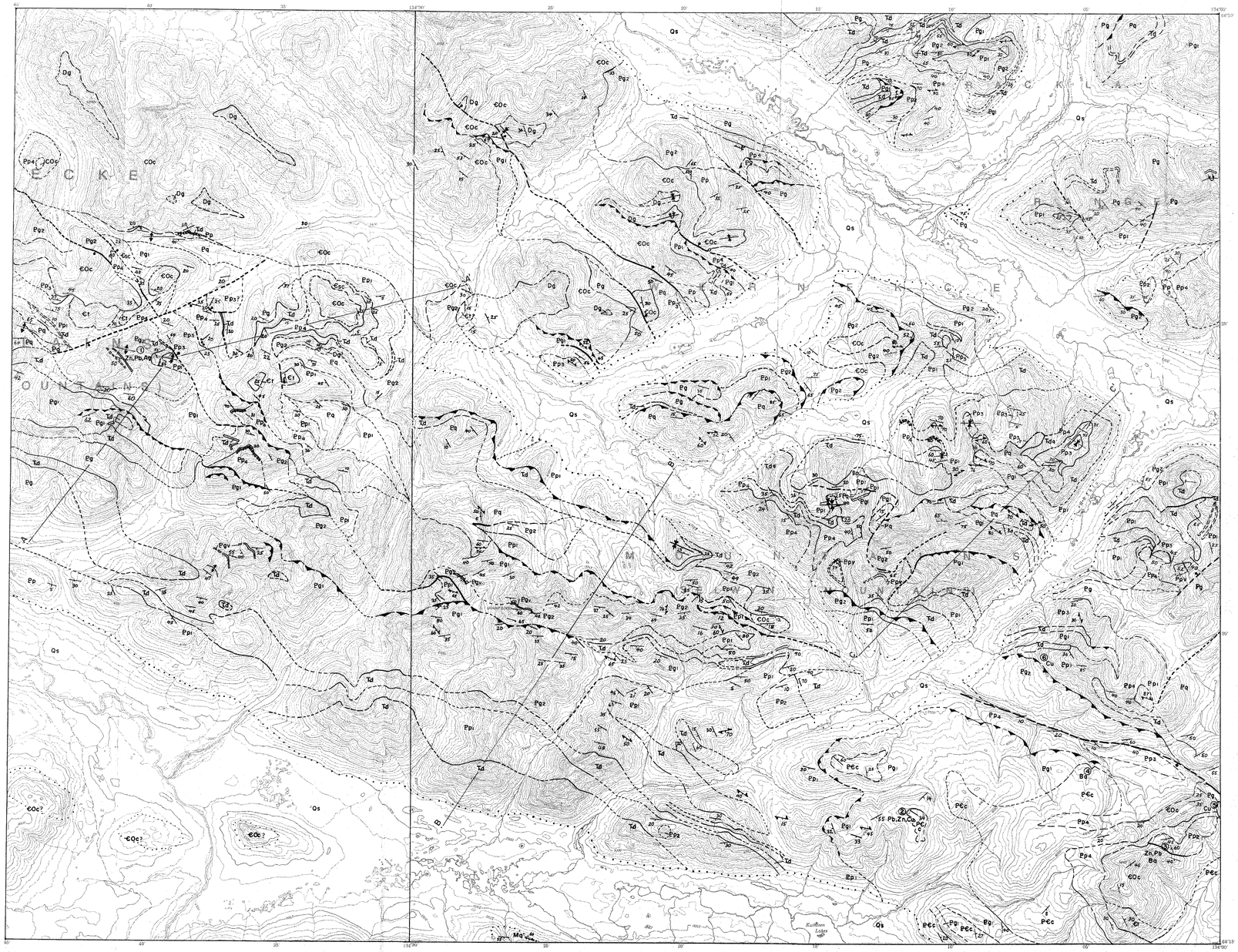

Legend

Triassic (may include older intrusions)

- Td, Tds — Fine- to medium-grained hornblende diorite sills and dykes. Medium-to-coarse grained hornblende quartz diorite. (Carbonate rocks altered by intrusions are white, de-dolomitized)

Mississippian(?)

- Mq — Fine-grained, dark grey to black quartzite and interbedded black, carbonaceous phyllite

Middle Devonian

- Dg — GOSSAGE FORMATION: alternating dark and light grey banded dolostone

Cambrian to Ordovician (and younger?)

- €Oc — Light grey weathering, thick-bedded and massive dolostone

Cambrian

- €t — Dark grey thin-bedded dolostone, with abundant siderite replacement along laminae and in fractures; in northeast includes tan- and green-weathering dolosiltstone: Possibly equivalent to TAIGA FORMATION of Norris (1982)
- €sc — Dark-weathering, medium-grained white sandstone, thick bedded and locally hematized, with maroon siltstone interbeds: Probably equivalent to SLATS CREEK FORMATION of Norris (1982)

Age uncertain: Probably Late Proterozoic or Cambrian

- Pcc — Light grey, medium-bedded limestone

Middle Proterozoic

Stratigraphically equivalent (but no lithologic similarities) to PINGUICULA GROUP of Eisbacher (1981). Several rock units resemble Units 4,5 of Thompson and Roots (1982; now called Lower Fifteenmile Group).

- Pp — Undivided (includes one or more rock types below)
- Pp4 — Grey and brown siltstone, dark grey fissile mudstone; 'oooss' conglomerate with quartz, plutonic and shale pebbles, arkose at base.
- Ppv — Volcanic breccia and conglomerate, mafic tuff
- Pp3 — Pink-weathering, poorly bedded dolostone; 'tungussoid', fine-laminated stromatolites (Mustard et al., 1990) diagnostic
- Pp2 — Brown, fine-grained sandstone, thin-bedded
- Pp1 — Dark grey siliceous siltstone at base, dark brown, fissile mudstone; minor thin beds of dark brown-weathering dolostone

GILLESPIE LAKE GROUP (Wernecke Supergroup)

- Pg — Undifferentiated divisions (not visited)
- Pg2 — Upper division: Orange-brown weathering, thick-bedded dolostone, with columnar stromatolites; interbedded fine sandstone and dark grey cherty mudstone; orange-weathering dolomitic limestone in southeast
- Pgv — Chloritized schist, formerly mafic flow and tuff deposit
- Pg1 — Lower division: Dark- and light brown-weathering, thin- to medium-bedded dolostone, locally cyclic from dolo-siltstone to mudstone

QUARTET GROUP (Wernecke Supergroup)

- Pq — Dark grey- or green-grey weathering quartz siltstone, typically with white alteration along bedding planes; slaty cleavage

- Limit of outcrop and geologic mapping
- Geologic contact (defined, approximate, assumed)
- Fault: sense of movement unknown (defined, approximate, assumed)
- Normal fault; ball on downthrown side
- Thrust fault; teeth on over-riding plate
- Bedding (inclined)
- Cleavage (inclined, vertical)
- Jointing (inclined, vertical)
- Zn,Pb,Cu — Sulphide occurrence (Zn: sphalerite; Pb: galena; Cu: chalcopyrite)
- Ba — Barite occurrence

Economic Mineralization

There are no mines in the map-area, although several prospects have been tested intermittently since the early fifties. Of the visited showings, only the Blende is currently under investigation.

① 64°24'N 134°40'W. Blende: Sphalerite, galena, pyrite, chalcopyrite and tetrahedrite occur in gash veinlets and the matrix of brecciated dolostone within the upper division of the Gillespie Lake Group (GLG). Unmineralized dark siltstone and pinkish weathering dolostone that unconformably overlie the GLG are interpreted Pinguicula strata. The mineralization is found as much as 300 m below the ridge crest discovery zone and 800 m to the southeast. This trend is coincident with a faulted anticline, and mineralization is therefore considered both structurally and stratigraphically controlled.
References : D.I.N.A. 1982, P. 195
D.I.N.A. 1986, p. 155

② 64°15'N 134°15'W Kathleen: Pine-grained galena was observed in limestone with abundant goethite, scorodite(?) and blue-black hematite; chalcopyrite is reported in coarse crystalline dolostone. Most trenches and drilling occur at the unconformity between deformed Gillespie Lake dolostone and outliers of white limestone of probable early Paleozoic age. Mineralization is reported to extend 1,100 m northeastward from the main showing. Reference: D.I.N.A. 1982, p. 194.

③ 64°17'N 134°02'W Zap: Sphalerite and galena in dolostone breccia and tetrahedrite and galena in black baritic dolostone are reported. The latter rock type occurs along fault splays between quartzite (to the east) and blue-grey weathering dolostone (probably Cambrian) in a south-facing cirque. Pods of translucent crystalline barite up to 1 m wide are prominent in the carbonate cliffs. The quartzite is medium-grained, mature, and could be a Pinguicula unit (Corn Creek member of Eisbacher, 1982), or might be an unrecognized early Paleozoic sandstone, but is unlikely the Mississippian quartzite. This lithology appears to extend eastward into Rusty Mountain map area. References: Morin et al. 1980, p. 15.

④ 64°18'N 134°05'W. Barite float was found around an old pit at the (unexposed) contact of oxidized Gillespie Lake dolostone with overlying Paleozoic(?) limestone.

⑤ 64°17'N 134°01'W Malachite and chalcopyrite flecks occur at contact of Gillespie Lake dolostone with overlying grey limestone (Paleozoic?).

⑥ 64°19' 134°06'W Chalcopyrite in 1 m wide white quartz vein cutting thin-bedded oxidized siltstone within the 'Pinguicula' Group.

Notes

The southern Wernecke Mountains are accessible by helicopter from Mayo (100 km southwest), or from the end of the road at the abandoned settlement of Wernecke (60 km south-southwest). A winter road follows the south side of the Beaver River, and an overgrown branch road passes north of the Kathleen Lakes.

The central part of the area, some 100 km^2 and including the peaks about 10 km north of Mount Good, is included in native land claims currently under negotiation.

Regional Setting and Structure

The map area lies within the Foreland Fold and Thrust belt. In the southern Wernecke Mountains the southeast structural trend of Proterozoic strata bends northward around Misty Creek Embayment, a re-entrant of the Paleozoic Selwyn Basin (Cecile, 1981). Paleozoic carbonates in the top left corner of the map area are part of a northwest-plunging synclinorium that extends into the northern Ogilvie Mountains. Remnants of younger strata on ridge crests are recumbantly folded, suggesting that a higher structural level has been almost completely eroded.

The Proterozoic units are telescoped along contraction faults and most have been thickened by structural imbrication. Thrusts are visible in only a few places; mostly they are inferred from older-over-younger stratigraphic relationships where units can be positively identified.

Wide northeast-trending valleys disrupt structural trends and thrusts. Underlying post-Early Cretaceous, near-vertical faults probably had a combination of dextral and vertical slip. The northwest trend of the Wind River valley, and a parallel drainage 12 km south of it, truncate the northeast valleys. They appear to be distant splays of the late Cretaceous and Early Tertiary Knorr-Richardson fault system (Norris and Hopkins, 1977) best displayed 50 km to the northeast. The Kathleen Lakes fault zone (Abbott, 1990) post-dates the diorite (as young as Triassic?) as well as Mississippian(?) quartzite. On a regional scale, it is a splay of the Dawson fault, and probably directly connected to the basal detachment.

Stratigraphy

These notes supplement discussion in Roots (1990). Some 3000 m of siliciclastic and dolomitic strata comprise the Quartet Group and Gillespie Lake Group in the map area. Both the **Quartet** and Pinguicula groups contain dark, fine-grained sediments that are difficult to distinguish (Table 1). Because thrusts are preferentially located within this incompetant lithology, the groups may be interleaved locally.

The **Gillespie Lake Group** is divided into a lower sub-unit (deep-vater depositional environment) grading into an upper sub-unit (shallov and tide-dominated environment). The lover division includes beds that coarsen and thicken upward, trough cross-bedded arenite, and tool marked and slump-folded mudstone layers. The upper Gillespie Lake division is characterized by columnar and domal stromatolites in shallowing-upward sequences, beach rock, beach rosettes and dessication cracks (Mustard et al., 1990). Molar-tooth structure and oolite-pisolite beds are visible where preserved by early silicification. Chloritized volcanic tuff (locally mafic flow) less than 2 m thick vas noted near the gradational boundary between these divisions in the Mount Good area.

Pinguicula is the group name applied to a complex assemblage of clastic and carbonate rocks deposited in the 600 Ma interval between the Gillespie Lake and Cambrian units. Internal stratigraphy is not understood, requiring integration with sequences northeast (type area) and west of the map area. The fine-laminated stromatolites in the pink dolostone member resemble those of the Lover Fifteenmile Group (proposed name, also Unit 5 of Thompson and Roots, 1982) in the Ogilvie Mountains. There a lateral facies change from carbonate shelf to deep-vater clastics spans 30 km. The predominantly clastic succession in this map area contrasts with the shallov-vater succession described by Eisbacher (1981) near Pinguicula Lake.

Lover Paleozoic, white-weathering limestone is separated from dolostone of similar age because composition reflects contrasting primary features. The dolostone unit ('CDb' in areas north and east; Norris, 1982) includes coarse syn-sedimentary breccia and arenaceous lenses. Pb-Zn-Cu and Ba showings occur in the southeast where the limestone unit unconformably overlies Gillespie Lake dolostone.

Tan-weathering sandstone may be **Slats Creek Formation**, which lies conformably beneath Cambrian dolostone 25 km north of the map area.

One of the most distinctive rock types is orange to grey-weathering, thin bedded limestone and dolostone laced with siderite veinlets and replacements along laminae. It is unclear whether this 'zebra rock' is a secondary characteristic, but this unit (tentatively correlated with **Taiga Formation**, Norris, 1982) occurs over significant areas near the Zap and north of the Blende showings.

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Table 1. Lithological characteristics to distinguish dark clastic rocks of the Quartet Group from those in the Pinguicula Group.

— monotonous succession of dark grey siltstone	— thick siltstone successions but colour varies: olive and brown
— white 'stringer' alteration along bedding planes, fine laminae	— contains thin sandstone, carbonate interbeds
— pervasive micaceous cleavage; breaks in long industrained splinters	— fissile and soft: breaks in small chips; disturbed pieces 'limke'
— surfaces minimally affected by weathering	— silvery grey clay-rich weathered surfaces diagnostic, limonitized
— silica-rich: surfaces covered with characteristic green and black lichen; talus has green cast	— no preferred lichen cover, but developed soil profile

106D/7 (East half)
WILLIAMS CREEK

106D/8

YUKON TERRITORY

Scale 1:50,000 Échelle

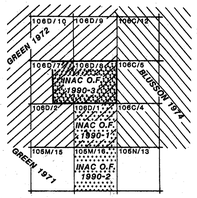
Miles 1000 0 1000 2000 3000 4000 Milles
Yards 1000 0 1000 2000 3000 4000 Verges

Acknowledgements

This map benefits from an earlier investigation of the Blende area in 106D/7 by Grant Abbott of Indian and Northern Affairs Canada, as well as discussions with D. Lister, D. Baton, S. Miller and R. Carne of Archer, Cathro and Associates, Ltd. I have incorporated some of their ideas but inadequacies of the interpretation remain my own, and these will certainly be modified by additional data.

Geologic mapping in 1989 was supported by S. Gordey of the Cordilleran Division, Geological Survey of Canada. R. Young and A. Shobridge (field assistants), D. Reid (helicopter pilot), L. Cymbalisty (base camp manager) and personnel of the Northern Affairs Program in Whitehorse and the Survey office in Vancouver all contributed to the success of fieldwork.

This open file and open files **1990-1** (by J.G. Abbott) and **1990-2** (by S. Gordey) resulted from a cooperative project between Indian and Northern Affairs Canada and the Geological Survey of Canada.



Indian and Northern Affairs Canada
Exploration and Geological Services Division
Yukon Region

Open File 1990-3

GEOLOGY OF 106D/8 AND 106D/7 (East half) MAP AREAS

by

Charlie Roots
Geological Survey of Canada

Sheet 1 of 1